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PATENT SPECIFICATION

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DRAWINGS ATTACHED

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(54) KIT OF PARTS FOR A STEERING WHEEL ATTACHABLE TO THE STEERING COLUMN SHAFT OF A MOTOR VEHICLE

(71) I, LESLIE LESTON, a British Subject, of 315 Finchley Road, London, N.W.3, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to a kit of parts for a steering wheel attachable to the steering column shaft of a motor vehicle and to a steering wheel assembly including the kit of parts.

A kit of parts according to the invention comprises a steering wheel having a hub with a central bore for receiving the end of a steering column shaft and three further bores for receiving the shanks of three screw bolts, a boss having a bore consisting of a first cylindrical portion and a second part conical portion integral and coaxial therewith which diverges to a diameter greater than said cylindrical portion of said bore having multiple internal splines for engagement with splines on a correspondingly shaped portion of a steering column shaft, in which the boss has three threaded bores for receiving the three screw bolts so that in use the steering wheel can be secured to the boss by passing said three bolts with their heads against the steering wheel hub through the further bores in the steering wheel hub into said threaded bores in the boss.

Thus, using a kit of parts according to the invention, a factory fitted steering wheel on a motor vehicle can be replaced by a further steering wheel having a different design. The further steering wheel is placed on the boss with the three bores of the hub in alignment with the threaded bores of the boss. The three bolts are then screwed into the threaded bores of the boss through the three further bores in the steering wheel hub to secure the steering wheel to the boss. The existing steering wheel is then removed. During this process a nut will be removed, which engages a threaded end portion of the steering column shaft. The bolted together steering wheel and boss are then placed over the end of the steering column shaft so that the internal multiple splines of the boss bore engage with the external multiple splines of a correspondingly shaped portion of the steering column shaft. The nut which was removed from the end of the steering column shaft is then replaced on the end of the steering column shaft to secure the steering wheel and boss to the column shaft.

The same boss may be used to secure a number of different steering wheels to a particular steering column shaft for example, flat or dished steering wheels.

This invention includes a steering wheel assembly for a motor vehicle comprising a boss having a bore consisting of a first cylindrical portion and a second part-conical portion integral and coaxial therewith which diverges to a diameter greater than said cylindrical portion, said bore having multiple internal splines in engagement with splines of the corresponding shaped portion of a steering column shaft, a steering wheel having a hub with a central bore encircling the steering column shaft, three screw bolts whose heads bear against the steering wheel hub and which pass through three bores in the steering wheel hub and into three threaded bores in the boss to secure the steering wheel to the boss, and a nut screwed onto a threaded end portion of the steering column shaft to secure the steering wheel and the boss to the steering column shaft.

This invention is illustrated by way of example in the accompanying drawings in which:

Figure 1 is a front view of the steering wheel hub portion of a kit of parts according to the invention, and;

Figure 2 is a cross-section through a kit of parts according to the invention assembled on the steering column shaft of motor car.

With reference to the drawings the kit comprises a steering wheel 6 having a hub 7 with a central bore 8 which receives the end of a steering column shaft 1. The hub 7 includes three bores 10*a*, 10*b*, 10*c*, which receive the shanks of three screw bolts 9. The hub 7 includes a hole 12 through which the horn actuator passes.

A boss 4 has a bore which consists of a first cylindrical portion 17A and a second part-conical portion 17B integral and coaxial therewith which diverges to a diameter greater than that of part 17A. Multiple internal splines of the bore engage with the external splines 3 of a correspondingly shaped portion of the steering column shaft. This arrangement prevents the boss 4 moving axially down the steering column shaft.

The boss has three threaded bores 18 (only two shown) for receiving the ends of the screw bolts 9. The three bores 10*a*, 10*b*, 10*c* and the three threaded bores 18 are spaced at equal distances from respectively the central longitudinal axis of the splined bore of the boss and of the hub of the steering wheel. In addition the three bores 10*a*, 10*b*, 10*c* and the three threaded bores 18 are equiangularly spaced about respectively the said axis of the splined bore of the boss and of the hub of the steering wheel.

The kit of parts is used as follows: The factory fitted steering wheel is first removed from the steering column shaft. This necessitates removing a nut 11 which engages a threaded end portion 19 of the steering column shaft. The steering wheel 6 is then attached to the boss 4 by passing the three bolts 9 with their heads bearing against the steering wheel hub 7 through the three bores 10 in the hub and into the threaded bores 18 of the boss. The combined steering wheel and boss is then placed on the steering column shaft so that the splines of the boss bore and of the shaft engage. The end of the steering column shaft passes through the bore 8 of the steering wheel hub. The combined steering wheel and boss is then secured to the steering column shaft by replacing the nut 11 on the threaded portion 19 which clamps the steering wheel hub and the boss against the tapered part of the steering column shaft.

In the particular embodiment shown in the drawings the following dimensions are used:—

Steering wheel hub central bore 8—Diameter 0.760 inches

Steering wheel hub bores 10*a*, 10*b*, 10*c* for the screw bolts 9—Diameter 0.260 inches

The hole 23 for the horn actuator—Diameter 0.312 inches

The centres of the bore 10 lies on a pitch circle 13 of Diameter 1.750 inches

The bore 12 lies on a pitch circle 14 of Diameter 1.500 inches.

WHAT I CLAIM IS:—

1. A kit of parts for a steering wheel attachable to the steering column shaft of a motor vehicle comprising a steering wheel having a hub with a central bore for receiving the end of a steering column shaft and three further bores for receiving the shanks of three screw bolts, a boss having a bore consisting of a first cylindrical portion and a second part-conical portion integral and coaxial therewith which diverges to a diameter greater than said cylindrical portion, said bore having multiple internal splines for engagement with splines on a correspondingly shaped portion of a steering column shaft, in which the boss has three threaded bores for receiving the three screw bolts so that in use the steering wheel can be secured to the boss by passing said three bolts with their heads against the steering wheel hub through the further bores in the steering wheel hub into said threaded bores in the boss.

2. A kit of parts according to Claim 1 in which the three threaded bores in the boss and the three further bores in the steering wheel hub are spaced at equal distances from respectively the central longitudinal axis of the splined bore of the boss and of the hub of the steering wheel.

3. A kit of parts according to either of Claims 1 or 2 in which the three threaded bores in the boss and the three further bores in the steering wheel hub are equiangularly spaced about respectively the central longitudinal axis of the splined bore of the boss and of the hub of the steering wheel.

4. A steering wheel assembly for a motor vehicle comprising a boss having a bore consisting of a first cylindrical portion and a second part-conical portion integral and coaxial therewith which diverges to a diameter greater than said cylindrical portion, said bore having multiple internal splines in engagement with splines of the corresponding shaped portion of a steering column shaft, a steering wheel having a hub with a central bore encircling the steering column shaft screw bolts whose heads bear against the steering wheel hub and which pass through three bores in the steering wheel hub and into three threaded bores in the boss to secure the steering wheel to the boss, and a nut screwed onto a threaded end portion of the steering column shaft to secure the steering wheel and the boss to the steering column shaft.

5. A steering wheel assembly substantially as herein before described with reference to the accompanying drawings.

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I SHEET *This drawing is a reproduction of the Original on a reduced scale*

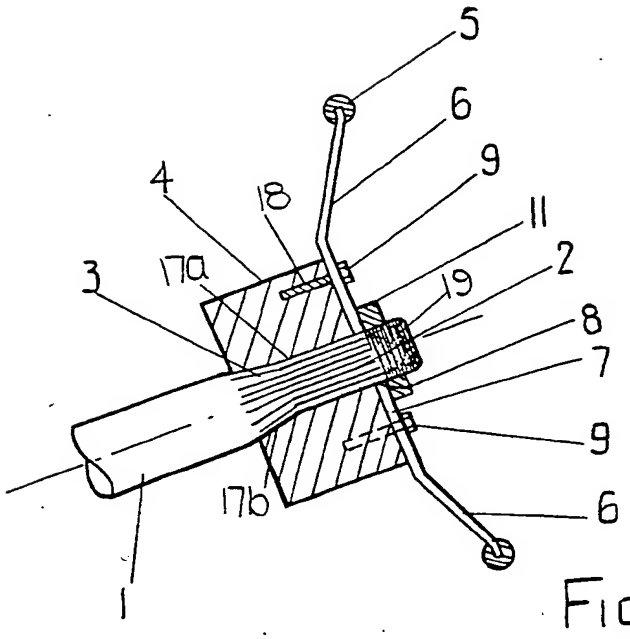

Fig. 2.

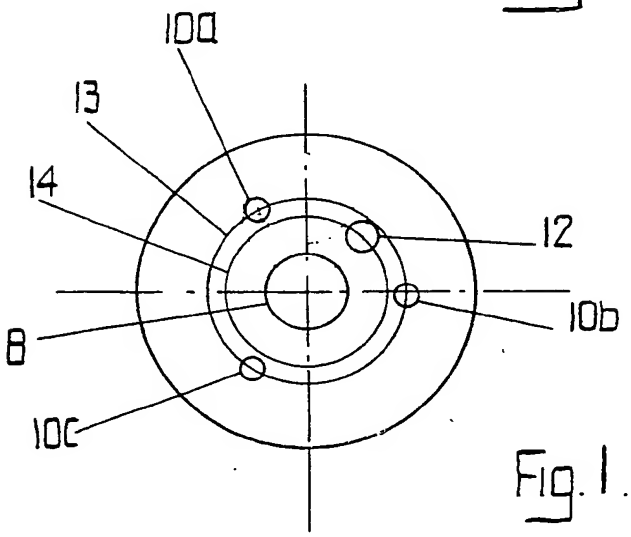

Fig. 1.